UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/058,191	10/26/2001	Kenneth Burdick	281-334	3947

20874 7590 10/09/2003

WALL MARJAMA & BILINSKI
101 SOUTH SALINA STREET
SUITE 400
SYRACUSE, NY 13202

EXAMINER	
DOLE, TIMOTHY J	

ART UNIT	PAPER NUMBER
2858	

DATE MAILED: 10/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application N .	Applicant(s)	
	10/058,191	BURDICK ET AL.	
	Examiner	Art Unit	
	Timothy J. Dole	2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 July 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-62* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *31-58 and 61* is/are allowed.

6)☒ Claim(s) *1-3,11-14,20,21,23-30,59,60 and 62* is/are rejected.

7)☒ Claim(s) *4-10,15-19 and 22* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 59 and 62 are rejected under 35 U.S.C. 102(e) as being anticipated by Pinto et al.

Referring to claim 59, Pinto et al. discloses a capacitive pressure sensor for measuring a stimulus parameter, the sensor comprising: a circuit board (fig. 6 (214)) including at least one metallic layer (fig. 6 (216)); a metallic diaphragm (fig. 6 (202)) coupled to the circuit board and juxtaposed to the metallic layer to thereby form a transducer capacitor characterized by a capacitance, the metallic diaphragm becoming substantially curved (fig. 2) relative to the at least one metallic layer in response to a change in the stimulus parameter such that the capacitance changes in accordance with stimulus parameter changes (column 2, lines 15-21); and an oscillator circuit (fig. 5 (136)) coupled to the transducer capacitor, the oscillator circuit being configured to generate a signal characterized by a frequency that changes in accordance with capacitance changes (column 2, lines 15-21). It should be noted that reference numeral 214 includes capacitor plate 216, insulator 218, and inductor coil 220 and is in the same form as fig. 1 (column 7, lines 8-12). Also, Pinto et al. discloses that the elements of fig.

1 may be constructed using printed circuit board techniques (column 5, lines 4-8). Therefore, reference element 214 could also be referred to as a circuit board.

Referring to claim 62, Pinto et al. discloses a capacitive sensor for measuring a stimulus parameter, the sensor comprising: a circuit board (fig. 6 (214)) including at least one metallic layer (fig. 6 (216)); a metallic diaphragm (fig. 6 (202)) coupled to the circuit board and juxtaposed to the metallic layer to thereby form a transducer capacitor characterized by a capacitance, the metallic diaphragm not including an attached metallic plate (fig. 6), the metallic diaphragm being adapted to move relative to the at least one metallic layer in response to a change in the stimulus parameter (column 1, lines 47-50) such that the capacitance changes in accordance with stimulus parameter changes (column 2, lines 15-21); and an oscillator circuit (fig. 5 (136)) coupled to the transducer capacitor, the oscillator circuit being configured to generate a signal characterized by a frequency that changes in accordance with capacitance changes (column 2, lines 15-21).

It should be noted that as stated above, reference numeral 214 is considered to be a circuit board.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 2, 11-14, 20, 21, 23, 24 and 26-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinto et al. in view of Bronowocki et al.

Referring to claim 1, Pinto et al. discloses a capacitive sensor for measuring a stimulus parameter, the sensor comprising: a circuit board (fig. 6 (214)) including at least one metallic layer (fig. 6 (216)); a metallic diaphragm (fig. 6 (202)) coupled to the circuit board and juxtaposed to the metallic layer to thereby form a transducer capacitor characterized by a capacitance, the metallic diaphragm being adapted to move relative to the at least one metallic layer in response to a change in the stimulus parameter (column 1, lines 47-50), whereby the capacitance changes in accordance with the change in the stimulus parameter (column 2, lines 15-21); and an oscillator circuit (fig. 5 (136)), whereby the frequency changes in accordance with capacitance changes (column 2, lines 15-21). It should be noted that as stated above, reference numeral 214 is considered to be a circuit board.

Pinto et al. does not disclose the oscillator circuit includes a low pass filter.

Bronowocki et al. discloses a pressure sensor with an oscillator (fig. 8 (240)), including a low-pass filter (fig. 8 (228)) coupled to the transducer capacitor (fig. 8 (200)), the oscillator circuit being configured to generate a filtered signal characterized by a frequency.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the low pass filter of Bronowocki et al. into the oscillator in the sensor of Pinto et al. for the purpose of attenuating signals outside the filter range whereby leading to more accurate data (column 10, lines 6-10).

Referring to claim 2, Pinto et al. discloses the sensor as claimed wherein the metallic diaphragm becomes substantially curved in response to the stimulus parameter (column 4, lines 17-22).

Referring to claim 11, Pinto et al. discloses the sensor as claimed except wherein the low-pass filter includes an impedance element coupled to a first shunt capacitor.

Bronowocki et al. discloses the low-pass filter includes an impedance element (fig. 1 (112)) coupled to a first shunt capacitor (fig. 1 (114)).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the low pass filter of Bronowocki et al. into the oscillator in the sensor of Pinto et al. for the same purpose as given in claim 1, above.

Referring to claim 12, Pinto et al. discloses the sensor as claimed except wherein the impedance element includes a resistor, or an inductor, or both.

Bronowocki et al. discloses the impedance element includes a resistor (fig. 1 (112)), or an inductor, or both.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the low pass filter of Bronowocki et al. into the oscillator in the sensor of Pinto et al. for the same purpose as given in claim 1, above.

Referring to claim 13, Pinto et al. discloses the sensor as claimed except wherein the first shunt capacitor is coupled to AC ground.

Bronowocki et al. discloses the first shunt capacitor is coupled to AC ground (fig. 1).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the low pass filter of Bronowocki et al. into the oscillator in the sensor of Pinto et al. for the same purpose as given in claim 1, above.

Referring to claim 14, Pinto et al. discloses the sensor as claimed except wherein the low-pass filter is connected to the input of the transducer capacitor.

Bronowocki et al. discloses the low-pass filter is connected to the input of the transducer capacitor (fig. 8 (214a)).

Referring to claim 20, Pinto et al. discloses the sensor as claimed wherein the metallic diaphragm (fig. 6 (202)) does not include an attached metallic plate.

Referring to claim 21, Pinto et al. discloses a capacitive sensor for measuring a stimulus parameter, the sensor comprising: a capacitor transducer (fig. 6) including at least one fixed plate member (fig. 6 (216)), the capacitor transducer being characterized by a variable capacitance, whereby the variable capacitance varies in accordance with a change in the stimulus parameter (column 2, lines 15-21); and an oscillator circuit (fig. 5 (136)) coupled to the capacitor transducer, (fig. 5 (132)) coupled to an input of the capacitive transducer, having a frequency, whereby the frequency is proportional to the stimulus parameter (column 2, lines 15-21).

Pinto et al. does not disclose an oscillator circuit including a low-pass filter, the oscillator circuit generating a non-sinusoidal signal.

Bronowocki et al. discloses a pressure sensor with an oscillator (fig. 8 (240)), coupled to the capacitor transducer (fig. 8 (200)), the oscillator circuit including a low-pass filter (fig. 8 (228)) coupled to an input of the capacitor transducer (fig. 8 (200)), the

oscillator circuit generating a non-sinusoidal signal having a frequency (column 6, lines 25-53), whereby the frequency is proportional to the stimulus parameter (abstract).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the oscillator of Bronowocki et al. into the sensor of Pinto et al. for the same purpose as given in claim 1, above.

Referring to claims 23 and 27-30, Pinto et al. discloses the sensor as claimed wherein the stimulus parameter is fluid pressure, pressure, force, displacement or humidity (column 4, lines 12-16). It should be noted that the sensor of Pinto et al. could measure the stimulus parameters listed above since all the parameters would cause a change in the capacitance of the sensor.

Referring to claim 24, Pinto et al. discloses the sensor as claimed, further comprising: a circuit board (fig. 6 (214)) including at least one metallic layer (fig. 6 (216)); and a metallic diaphragm (fig. 6 (202)) coupled to the circuit board and juxtaposed to the metallic layer to thereby form the variable capacitor transducer, the metallic diaphragm being adapted to move relative to the at least one metallic layer in response to a change in the fluid pressure (column 1, lines 47-50), whereby the variable capacitance changes in accordance with the change in the fluid pressure (column 4, lines 12-16).

Referring to claim 26, Pinto et al. discloses the sensor as claimed except wherein the low-pass filter includes a shunt capacitor (fig. 4A (130)) and a resistor (fig. 4A (120)).

Bronowocki et al. discloses the low-pass filter includes a shunt capacitor (fig. 1 (114)) and a resistor (fig. 1 (112)).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the low pass filter of Bronowocki et al. into the oscillator in the sensor of Pinto et al. for the same purpose as given in claim 1, above.

5. Claim 60 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pinto et al. in view of Pechoux et al.

Referring to claim 60, Pinto et al. discloses a capacitive sensor for measuring a stimulus parameter, the sensor comprising: a circuit board (fig. 6 (214)) including at least one metallic layer (fig. 6 (216)); a metallic diaphragm (fig. 6 (202)) coupled to the circuit board and juxtaposed to the metallic layer to thereby form a transducer capacitor characterized by a capacitance, the metallic diaphragm being adapted to move relative to the at least one metallic layer in response to a change in the stimulus parameter (column 1, lines 47-50) such that the capacitance changes in accordance with stimulus parameter changes (column 2, lines 15-21); a pressure port assembly (fig. 6 (210b)), whereby a cavity (fig. 6 (204)) is formed between a pressure port and the metallic diaphragm; and an oscillator circuit (fig. 5 (136)) coupled to the transducer capacitor, the oscillator circuit being configured to generate a signal characterized by a frequency that changes in accordance with capacitance changes (column 2, lines 15-21).

Pinto et al. does not disclose a conductive ring disposed between the metallic diaphragm and the circuit board.

Pechoux et al. discloses a conductive ring (fig. 2 (8)) disposed between the metallic diaphragm (fig. 2 (7)) and the circuit board (fig. 2 (13a)) and a pressure port (fig.

2 (9)) assembly coupled to the conductive ring, whereby a cavity (fig. 2 (5a)) is formed between a pressure port and the metallic diaphragm.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the conductive ring of Pechoux et al. into the sensor of Pinto et al. for the purpose of ensuring electrical connections are made between the circuit and the diaphragm whereby leading to results that are more consistent and accurate (column 4, lines 34-37).

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pinto et al. in view of Bronowocki et al. as applied to claim 1 above, and further in view of Pechoux et al.

Referring to claim 3, Pinto et al. as modified discloses the sensor as claimed, further comprising a pressure port assembly (fig. 6 (210b)), whereby a cavity (fig. 6 (204)) is formed between a pressure port and the metallic diaphragm.

Pinto et al. as modified does not disclose a conductive ring disposed between the metallic diaphragm and the circuit board.

Pechoux et al. discloses a conductive ring (fig. 2 (8)) disposed between the metallic diaphragm (fig. 2 (7)) and the circuit board (fig. 2 (13a)) and a pressure port (fig. 2 (9)) assembly coupled to the conductive ring, whereby a cavity (fig. 2 (5a)) is formed between a pressure port and the metallic diaphragm.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the conductive ring of Pechoux et al. into the sensor of Pinto et al. as modified for the purpose of ensuring electrical connections are made between the

circuit and the diaphragm whereby leading to results that are more consistent and accurate (column 4, lines 34-37).

7. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pinto et al. in view of Bronowocki et al. as applied to claims 21, 23 and 24 above, and further in view of Wallrafen.

Referring to claim 25, Pinto et al. as modified discloses the sensor as claimed except wherein a second capacitor forms a capacitance divider with an inter-plate capacitance generated between the metallic diaphragm and the metallic layer.

Wallrafen discloses a second capacitor (fig. 2 (7)) forms a capacitance divider with an inter-plate capacitance generated between the metallic diaphragm and the metallic layer (column 1, lines 34-38).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the second capacitor of Wallrafen into the sensor of Pinto et al. for the purpose of inexpensively and reliably evaluating a signal from a capacitive sensor (column 1, lines 29-33).

Response to Arguments

8. Applicant's arguments with respect to claims 1-30 and 60 have been considered but are moot in view of the new ground(s) of rejection.

9. Applicant's arguments filed July 14, 2003 have been fully considered but they are not persuasive.

10. In response to Applicant's argument with respect to claims 59 and 62, that the references fail to show certain features of applicant's invention, it is noted that the features upon which

applicant relies (i.e., "a flexible membrane that is spherical in nature" (page 8, paragraph 2)) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Allowable Subject Matter

11. Claims 31-58 and 61 are allowed.

12. Claims 4-10, 15-19 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy J. Dole whose telephone number is 703-305-7396. The examiner can normally be reached on Mon. thru Fri. from 8:00 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on 703-308-0750. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

TJD

N. Le
Supervisory Patent Examiner
Technology Center 2800